‘Expert’ Weight Transmitter

FEATURES
- Individually digitized transducer data
- Continuous ‘Expert System’ diagnostics
- Dynamic digital filtering
- 750,000 count resolution psr channel - 20 updates/sec.
- Multi-function set-up and calibration display
- Fault protected transducer excitation

DESCRIPTION
The DXp-40 digital transmitter individually digitizes each transducer in a multi-cell weigh system for the purposes of greater system resolution and accuracy, and continuous diagnostics of system and transducer performance. In addition to the benefits of operational security, keypad calibration of each transducer eliminates the need for on-site deadweight calibration on many systems. Optional Dynamic Digital Filtering maximizes stability and dynamic response by continuously analyzing system noise characteristics and automatically adjusting software filtering parameters.

APPLICATIONS
- High value product batching
- Pharmaceutical process
- Weighing
- Fault tolerant weigh systems

CONFIGURATION
The optional 16 bit analog output provides a high-resolution weight data interface for non-digital process control equipment. Available discrete I/O points (4 inputs and 4 outputs) offer local setpoint control or diagnostic alarm status annunciation.

DXp-40 units provide designers with a wide range of communication and network options. Available 'Easy Digital Interfaces' include Allen-Bradley Remote I/O, Modbus RTU, and conventional ASCII.

The DXp-40 is housed in a NEMA 4 or 4X enclosure and carries FM/CSA Approvals for Division 2 hazardous locations.
Model DXP-40
Vishay BLH ‘Expert’ Weight Transmitter

OPERATING MODE DESCRIPTION

Sigma Delta A-D Conversion

Very high-resolution weight data is obtained by using an individual Sigma Delta A-D converter for each transducer input. This new technology uses a high-speed integrator coupled with a digital signal processor to produce a precision of up to one part in 750,000.

Dynamic Digital Filter

The combination of new A-D technologies and multi-channel control produce large quantities of internal weight information that is sampled and evaluated statistically to determine the sample mean and standard deviation. This vital information is then used to optimize filter averaging and filter cutoff bands to maximize both data stability and response to true weight changes.

Multi-Channel Synchronous

A patented method to control the timing of several dependent A-D converters with a single microprocessor allows for the use of individual transducer data without accumulated errors due to mass moving within a vessel. This capability makes it possible to individually digitize each transducer in a multi-cell system and achieve the benefits of additive resolution and system redundancy.

Expert System Diagnostics

The DXp-40 uses the expert system concept to compare various measurements against known standards of acceptable performance and uses that relative comparison to identify and diagnose both transducer and system performance problems. The BLH expert system can identify piping influences, structural problems, transducer drift and overload, and the location and characteristics of process noise.

Allen Bradley Network

The DXp-40 is also available with the Allen Bradley Remote I/O interface technology, which provides a very simple way to communicate weight and diagnostics information to the PLC-5 series of programmable logic controllers. Also, the DXp-40 can communicate using MODBUS™ or other industry standard protocols.
PERFORMANCE ENHANCEMENT

Maximum Performance

The DXp-40 combines true on-line transducer and system diagnostics, fault tolerance, and very high performance measurement capabilities. It is designed for applications involving the manufacture of high value product where downtime, undetected errors, and limited precision cannot be tolerated.

Set-Up and Operation

Set-up, calibration, and operating parameters are easily entered using the two line 40-character LCD display and a series of 4 'soft' buttons. The display also allows the operator to view individual transducer data simultaneously during the normal operating mode.

Optional I/O

The optional discrete and analog I/O can be used for local process control thereby reducing operating functions from the host computer. The Analog output is based on a high-resolution 16-bit D/A conversion. The four discrete inputs control remote gross/net, tare and selection of two preset filters. The four relay outputs can be mapped to either set point or diagnostic alarm functions.
## SPECIFICATIONS

### Performance
- **Internal Resolution**: 4,194,304 total counts
- **Max. Display Resolution**: 3,000,000 total counts
- **Max. Res. Per Channel**: 750,000 counts
- **Conversion Speed**: 50 msec (20 updates/sec)
- **Sensitivity (Noise)**: 0.001 1% full scale (max +/-16 counts w/o filter)
- **Full Scale Range**: 35 mV/channel
- **Dead Load Range**: 100%
- **Input Impedance**: 10 M-ohms, min. per channel
- **Load Cell Excitation**: 10 V (65 mA/channel max)
- **Remote Sense**: user configurable, each channel
- **Linearity**: +/-0.0015% of full scale
- **Calibration Repeatability**: 0.3 pV per count
- **Software Filter (Std.)**: 50 to 10,000 msec
- **Optional Auto-Tune Filter**: multi-variable up to 10,000 msec

### Temperature Coefficient
- **Span/Zero**: +/-2ppm/°C
- **Step Response**: one conversion
- **Common Mode Rej.**: 100 db @ 60 Hz
- **Normal Mode Rej.**: 100 db above 35Hz

### Environment
- **Operating Temperature**: -10 to 55°C (12 to 131°F)
- **Storage Temperature**: -20 to 85°C (-4 to 185°F)
- **Humidity**: 5 to 90% rh, non-condensing
- **Voltage**: 117/230 + 15% 50/60 Hz
- **Power**: 12 watts max

### Enclosure
- **Dimensions** (NEMA 4/4X):
  - 11.5x 8.0 x 4.3 HWD
- **Optional (Explosion Proof)**:
  - 12.875 x 10.875 x 8.188 HWD
- **Parameter Storage**: EEPROM
- **EMI/RFI Shielding**: shielded from typical interference

### Internal Display/Operator Interface
- **Standard**:
  - LCD Display 2 columns of 20 characters each
- **Optional VFD Display**:
  - High visibility, vacuum fluorescent same columns/characters as std.
- **Interface**:
  - 4 ‘soft buttons’

### Isolated Analog Output
- **Type**: 16 bit digital to analog
- **Voltage**: 0-10 V (25k ohm min load)
- **Current**: 4-20 mA (600 ohm max load)

### Relay Outputs (Optional)
- **Closed Contact**: 28V ac/dc at 0.4 amps (max)
- **Solid State**: 110/220 Vac at 1.0 amp

### Digital Inputs
- **Logic’0’ (Low)**: less than 0.5Vdc, sink 3mA
- **Logic’1’ (High)**: 10 to 28 Vdc (TTL open collector)
- **Mechanical Relay’0’**: closed (one side = digital common, the other side = input)
- **Mechanical Relay’1’**: open (input internally pulled up)

### Network Serial Communication (Std)
- **Type**: RS-485 Half Duplex (Multi-Drop)
- **Baud**: 9.6K, 28.8K’ and 56.7k
- **Data Format**: proprietary

### Simplex Data Output (Standard)
- **Type**: RS-485 (Simplex)
- **Baud**: 1200 or 9600
- **Data Format (Selectable)**: ASCII 7 data bits, even parity, stop bit

### Terminal/Computer Interface (Optional)
- **Interface Type**: RS-485 half duplex (standard)
- **Baud**: 1200 or 9600
- **Protocol**: duplex command/response format
- **ASCII**: 7 data bits, even parity, stop bit

### Special Protocols (Optional)
- **Modbus**: RTU Protocol

### Special Interface (Optional)
- **Allen Bradley Remote I/O**: Remote I/O - 1/4 logical rack

### Weight
- **NEMA 4/4X**: 12.0 pounds

### Approvals
- **FM (Factory Mutual)**: 3611 (Class I, II, III; Div.1,2; Groups A-G)
- **CSA**: C22.2 (Class I, II,III; Div.1,2; Groups A-G)

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